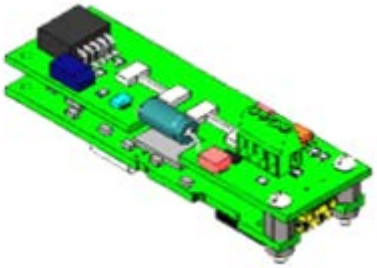
OEM Xchange™ Primary Mount
User Manual



Version 1.5 15 Jan 2013

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General Description of the Instrument

The AML Oceanographic X series instruments and sensors provide a major advancement in ocean instrumentation. The swappable and interchangeable sensor technologies dramatically improve the capabilities of ocean instrumentation. These capabilities include:

- Changing the instrument sensor types, while at sea, within seconds, and without tools. For example the same instrument can be changed from a CTD to a sound speed profiler.
- The sensor ranges can be swapped as sampling conditions change to maximize the instrument's resolution and accuracy. For example, a deep pressure sensor can be swapped for a shallow pressure sensor, and the salt water conductivity sensor can be swapped for a fresh water conductivity sensor.
- Sensors from one instrument can be swapped to another instrument to maintain mission critical capabilities.
- Calibrated sensors can be sent to the instrument so that the instrument does not need to be removed from service for calibration.
- Spare sensors ensure that an instrument can be immediately returned to service after catastrophic damage, such as a high speed impact with the ship's hull.
- All calibration and traceability data resides within each sensor. There is no need update instrument configuration files or coefficients. Calibration data for all sensors is instantly available from the instrument, and calibration certificates can be printed from AML Oceanographic's SeaCast software whenever the instrument is connected.
- Logged data is stamped with sensor traceability and instrument configuration data. So there is never a doubt about how the data was collected or the status of the sensor's calibration.
- Since only the sensors need to be returned for recalibration the shipping costs are dramatically reduced.

The OEM Xchange™ Primary Mount is a miniature, single-sensor member of the X•series family. It is externally powered and provides the data via cable. It is designed primarily for sonar transducer array with SV•Xchange™ but provides many possibilities in other applications. Communications with the OEM Xchange™ Primary Mount are accomplished with RS-232, RS-485 or TTL, depending on what is ordered from the factory. Sampling rates are programmable by time (25 Hz to every 24 hours).

The OEM Xchange™ Primary Mount is equipped with only one Xchange™ sensor port. Due to the interchangeability of Xchange™, a sound velocity or conductivity sensor can be used with the primary port (P1).

An OEM Xchange™ Primary Mount with a primary Xchange™ sensor port cannot accept Xchange™ sensors designed for a secondary port. For information on the use of temperature, pressure, DO and turbidity sensors, refer to the OEM Xchange™ Secondary Mount User Manual.

Which Manual Do I Start With?

AML Oceanographic's Xchange™ instruments are shipped with several manuals on the CD:

- An instrument manual (ie. This OEM Xchange™ Primary Mount manual) which provides an overview on how to use and maintain the instrument;
- A software manual (ie. SeaCast) which provides instructions on how to use the software to configure the instrument and review instrument data;
- Xchange™ sensor manuals (C•Xchange™, SV•Xchange™) which both provide overviews on how to install and maintain each of the Xchange™ sensors.

If you are configuring a sensor for field use or lab test, we recommend that you begin with the software (SeaCast) manual.

If you are focused on instrument maintenance, we recommend that you begin with the instrument manual.

If you are wishing to swap an Xchange™ sensor, we recommend that you read the appropriate Xchange™ manual.

Shipping & Receiving

Receiving an Instrument

When an instrument is received at a new location it is prudent to perform the following steps to ensure the instrument is capable of performing when required.

- Check the shipping container for signs of damage. This could indicate damage to the instrument inside.
- The shipping package should include all of the following items
    - OEM Xchange™ Primary Mount board set (2 circuit boards if RS-232 or RS-485 and 1 for TTL)
    - One sensor bulkhead connector
    - One sensor port blanking plug
    - CD with manuals and documentation
- Check for damage
    - Check the connector sockets for corrosion, dirt and salt deposits
    - Check the circuit boards for damage
- Check the Xchange™ sensor is installed tightly. The blue retaining ring should be within 1 mm of the instrument end cap.
- Connect the instrument to a computer with the data cable and perform a scan, or monitor if using SeaCast.

Returning an Instrument to the Factory

- If shipping for repair or recalibration, obtain an RMA number from the service centre.
- Pack the instrument in its original shipping box, if possible, to prevent damage during shipping

An RMA number can be requested using any of the following contact options:

Service Department:
Email: service@AMLoceanographic.com
Phone: 1-250-656-0771
Phone : 1-800-663-8721 (NA)
Fax: 1-250-655-3655

Website:
http://www.AMLoceanographic.com

Customer Portal:
RMA requests may also be submitted through *My AML Oceanographic* (once logged in) or by navigating to the 'support' tab on the AML Oceanographic website.

Mailing and Shipping Address:
AML Oceanographic.
2071 Malaview Ave.
Sidney, BC, Canada
V8L 5X6

Using the Instrument

Installation

Refer to OEM specification drawings at the back of the manual (pg. 23-26) for mounting details.

Pressure Ratings

The OEM sensor bulkhead connector is rated to 6000 dbar. The pressure rating for both the SV•Xchange™ and C•Xchange™ sensors are also rated to 6000 dbar. Deployments should never exceed this pressure rating.

Pre-Deployment Procedures

- Upon Receipt
  - Use the receiving steps above to verify the instrument is in good working order.
  - Verify the calibrations of all sensors are valid for the duration of the deployment. If not, swap the Xchange™ sensors for sensors with valid calibrations or send the Xchange™ sensors to a service center for recalibration.
  - Verify that the pressure range for either the SV•Xchange™ or C•Xchange™ sensor being used is appropriate for the depth of the deployment.

Caution: Install blanking plugs in all unused sensor ports prior to deployment. Failure to install blanking plugs will result in damage to the connectors.

C•Xchange™ & SV•Xchange™ blanking plug

- The intent of an OEM product is to offer integration and flexibility for the manufacturer. Please consult AML for guidance or assistance with your specific application.
- Ensure bulkhead and electronics are secure

Configuring Sampling Parameters using SeaCast

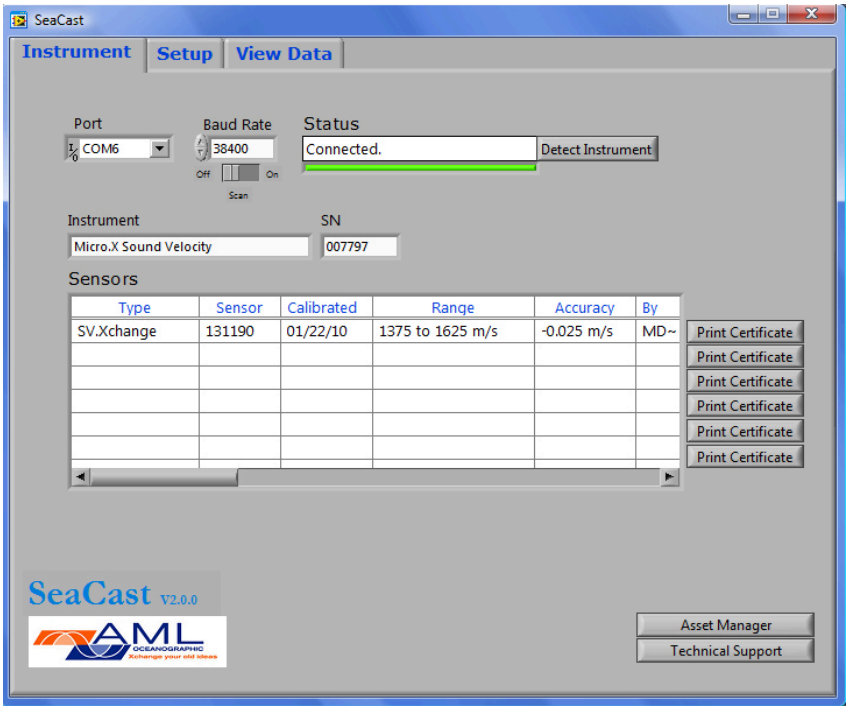
AML Oceanographic' SeaCast application software greatly simplifies the process of setting up an instrument to complete a profile.

Full details on the instrument configuration process can be found in the SeaCast manual. Below please find a quick summary of that process:

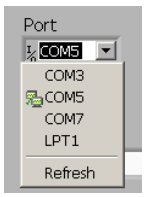
- Note that for OEM integration, SeaCast is not required. However, SeaCast offers a good overview of what is possible with the AML API. Please consult AML for more information.

Selecting an instrument for configuration

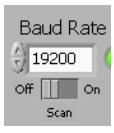
On the Instrument Tab, the first row of fields 'Port', 'Baud Rate' and 'Status' control and display the communications with the instrument.



The 'Port' field allows the user to select the computer communications port to which the instrument is connected. If uncertain about the port the user can check the ports in the Device Manager or Hardware Manager found in the control panel in the Windows operating system. The 'Refresh' selection at the bottom of the list allows the user to force a new detection of available ports. This is useful if a USB connection is made after SeaCast is launched.

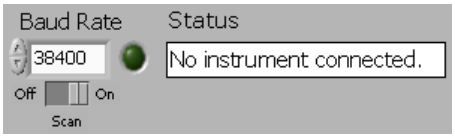


The 'Baud Rate' field is used to select the baud rate the user wishes to use while communicating to the instrument. Lower baud rates allow longer cables to be used if using RS-232/485/422. Higher baud rates shorten the data transfer times. Choose 38,400 baud (default) whenever possible.

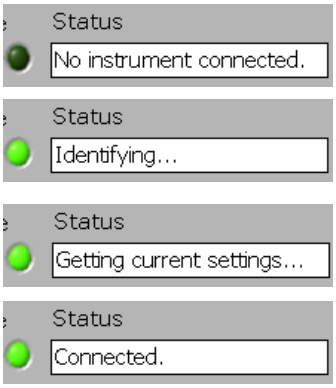


If an instrument is set to autobaud (default setting) it will detect the baud rate chosen in SeaCast and communicate at that baud rate. If the baud rate is changed in SeaCast then power to the instrument must be cycled to re-establish communications at the new baud rate.

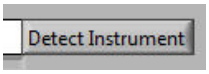
Some instruments are set up to communicate at fixed baud rates. In this case, the baud rate in SeaCast must be set to the same baud rate as the instrument. If the instrument baud rate is unknown, the 'Scan' switch below the 'Baud Rate' field can be used to have SeaCast cycle through all the baud rates to try to detect the instrument baud rate.



The "Status" field shows the status of the communications with the instrument. The green light indicates that communications have been established with the instrument. During the identification process, SeaCast is determining the type and serial number of the instrument and any connected sensors. During the settings process, SeaCast is determining the latest sampling and logging settings that were programmed into the instrument. When all the required handshaking has been completed, the 'Status' field will show "Connected" and the user may now use the instrument. Please note that the handshaking can take up to 30 seconds to complete.

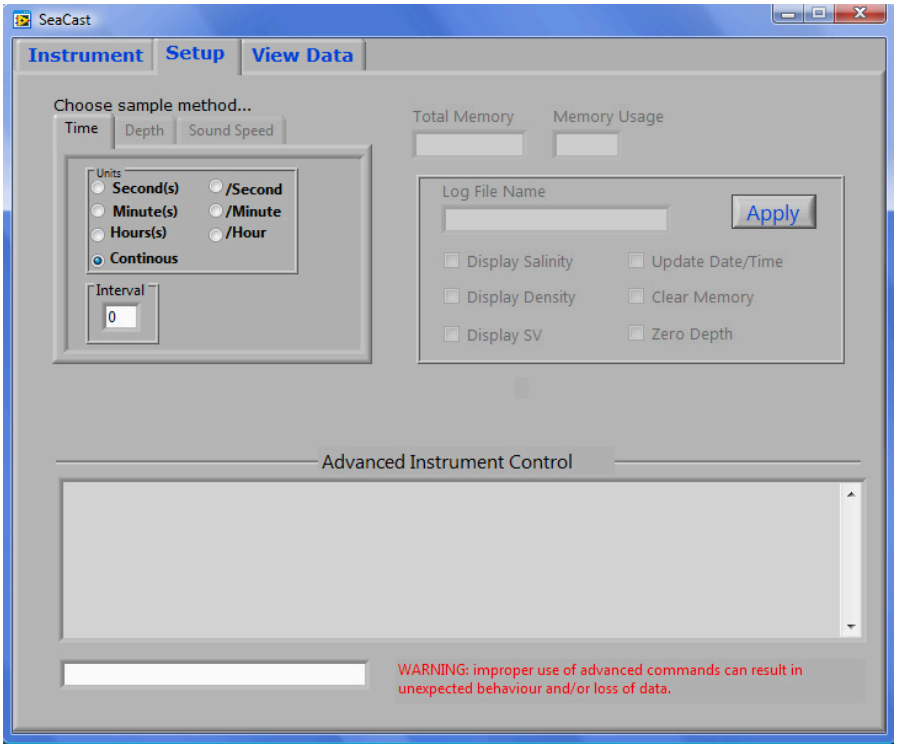


The Detect Instrument button forces SeaCast to re-detect and re-identify the instrument and its sensors.

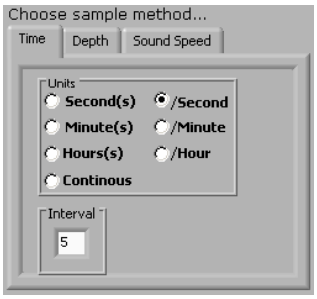


Configuring the selected instrument

After the instrument has been detected by SeaCast, select the 'Setup' tab at the top of the SeaCast window.



The box in the upper left of the Setup page controls the sampling of the instrument. For the OEM Xchange™ Primary Mount only the time increment sampling method is available. I.e. sample at 25 times per second, 10 times per hour, every 5 seconds, etc. The continuous selection sets the instrument to sample as fast as possible. For the OEM Xchange™ Primary Mount this is 25 Hz.



Sampling Method Selection Tab

Instrument time, memory & log file settings

The OEM Xchange™ Primary Mount does not contain batteries, internal memory or a real-time clock. Therefore time stamps and data logging are not available.

Configuring Sampling Parameters using HyperTerminal

Instruments can also be configured for deployment using HyperTerminal or other terminal emulation programs. HyperTerminal will need to be used for TTL. As with SeaCast, communications with the instrument must be established using the correct communications port and settings. The communications settings are 8 data bits, 1 stop bit, no parity, no flow control and the desired baud rate.

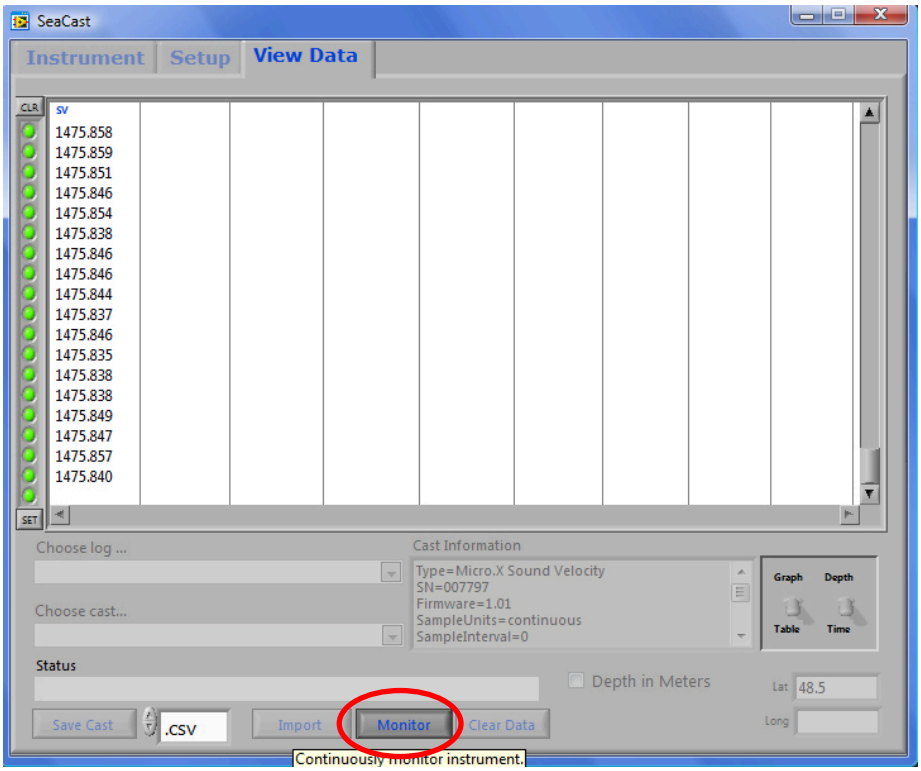
The sampling parameters can be programmed by entering text commands. The following are examples:

SET SAMPLE RATE CONTINUOUS	(Sets the sample rate to as fast as possible (25 Hz))
SET SAMPLE RATE 5/s	(Sets the sample rate to 5 samples per second)
SET P INC 1	(Sets the sample rate to pressure increments of 1 dBar)
SET SOUND INC 2	(Sets the sample rate to speed increments of 2 m/s)

Please consult the Commands section of the Appendix for full syntax details on how to issue the commands in question. Please note that the above are example commands only; many additional sampling regimes can be established.

Monitoring Real Time Data

- Ensure the pre-deployment procedures have been done (see Page 6).
- Ensure that the desired sampling requirements have been selected and applied.
- Plug the data/power cable into the instrument. If you power the instrument over a long cable, please note the following:
    - The longer the cable the higher the voltage drop on the cable. The voltage drop on a standard AML cable, with a standard OEM Xchange™ Primary Mount, is about 1 volt per 100m of cable.
    - The instrument's lowest voltage is 8 volts.
    - The instrument's maximum voltage is 16 volts.
    - The voltage at the instrument, while sampling, must be above the shutdown level for the instrument to operate.
- Begin monitoring data using SeaCast or HyperTerminal.



Post-Deployment Procedures

- When the instrument is pulled from the water it should be rinsed in fresh water.
- If Applicable, dry the area around the connectors with a clean cloth or compressed air prior to disconnecting the plugs or cables, when data/power cable is removed, ensure the appropriate dummy plug is placed in the connector to protect it.
- Dry the instrument and stow it securely.

Configuring the Instrument for Data on Power Up

Perform the following steps:

- Open a terminal emulation program, such as HyperTerminal, and ensure the serial port has been selected in the program. If the instrument has been set to a specific baud rate with the SET DETECT command the terminal emulation program must be configured for that baud rate.
- Connect the instrument to the computer using the data/power cable supplied with the instrument.
- Using the terminal emulation program issue the following commands to the instrument:

    - SET STARTUP NOHEADER (disables the power up header information)
    - SET STARTUP MONITOR (enable data output on power up)
    - SET SAMPLE RATE 10/S (set the desired sampling rate)
    - SET DETECT 07 (set fixed 38400 baud rate)

    Note details on the SET DETECT command can be found in the appendix.

- Unplug the data/power cable from the instrument to turn the instrument off.
- Plug the data/power cable into the instrument to turn the instrument on.

Disabling Data on Power Up

Perform the following steps:

- Open a terminal emulation program, such as HyperTerminal, and ensure the serial port has been selected in the program. If the instrument has been set to a specific baud rate with the SET DETECT command the terminal emulation program must be configured for that baud rate.
- Connect the instrument to the computer using the data/power cable supplied with the instrument. Instrument data will stream through the terminal emulation program window.
- Unplug the data/power cable from the instrument to turn the instrument off.
- Hold down < ENTER >
- Plug the data/power cable into the instrument to turn the instrument on.
- Release the <ENTER> key once the prompt '>' is displayed.
- Using the terminal emulation program issue the following commands to disable data on power up:

    - SET STARTUP HEADER (enables the power up header information)
    - SET STARTUP PROMPT (disable data output on power up)
    - SET SAMPLE RATE 10/S (selects the desired sampling rate)
    - SET DETECT A7 (set 10 autobaud attempts then default to 38,400 baud)

    Note details on the SET DETECT command can be found in the appendix.

- Unplug the data/power cable from the instrument to turn the instrument off.

Maintaining the Xchange™ Sensor

Periodic Maintenance

Periodic maintenance will prolong the life of the Xchange™ sensor. The following is recommended:

- If the Xchange™ sensor is very dirty or oily use warm soapy water and allow the instrument to soak before cleaning with a rag or soft brush. Rinse with fresh water.
- Before each use
    - Check the tightness of the swappable sensor
    - Check for nicks and cuts on the cable (If you are using a cable on this application)
- After each use
    - Clean and rinse the the Xchange™ sensor using fresh water
    - Dry and safely store the instrument
- Yearly
    - Send the Xchange™ sensors and/or board to a service centre for diagnostics and re-calibration

Communications

PC Settings

The OEM Xchange™ Primary Mount will communicate with either RS-232, RS-485 or TTL serial connections depending on how the instrument was ordered from the factory. The computer to which the instrument is connected must be set up as follows:

- 8 bits
- 1 stop bit
- No parity
- No hardware handshaking
- Baud rate of 600, 1200, 2400, 4800, 9600, 19,200 or 38,400 baud (default)

After power up, the OEM Xchange™ Primary Mount Instrument will wait for an ASCII carriage return. The instrument will automatically detect the baud rate when the enter key is depressed.

Output Formats

Output formats can be modified by the user. If the modifications required are not supported by the commonly used command list in the next section, please contact the factory for assistance.

The user can change:

- The number of decimal places for each channel
- Turn on, or off power up information (header),
- Turn on, or off, automatic monitoring on power up
- Turn on, or off, the ability to have monitor default on, known as "automonitor"
- Turn on, or off, a NMEA-like output format

Default output format

The output from the OEM Xchange™ Primary Mount is space separated values. There are commands to change the delimiter to tab or comma separated values if required.

The following table shows the output units for each Xchange™ sensor.

Sensor	Units	Default Format	Notes
SV•Xchange™	m/s	1480.123	
Conductivity•Xchange™	mS/cm	12.123	

Example outputs:

Example outputs for a sound velocity Xchange™ sensor
are shown below. User inputs in the output capture shown below are in bold type.

Micro.X Sound Velocity Version 1.05 SN: 004887
AML Oceanographic Ltd.
SV.Xchange Sensor SN: 200000, Calibrated 01/12/13

>**scan**
1475.847
>**monitor**
1475.857
1475.853
1475.881
1475.850
1475.870
1475.859
>**display options**
[Instrument]
Type=Micro.X Sound Velocity
SN=004887
Firmware=1.05
SampleUnits=/ second
SampleInterval=10
DisplayHeader=yes
StartupMode=Prompt
DetectionMode=a5
SVAveraging=2
SVThreshold=2.000
RX=on
TrailingSpace=off
SQ=off
ConductivityFormat=23
SVFormat=42
StartupRawReal=Real
ConductivityUnits=mS/cm
SVUnits=m/s
AddressMode=off
AddressByte=09
SerialParity=none
SerialEcho=on
CommunicationsDelay=0
SVZeroSuppressionUnits=second
SVZeroSuppressionInterval=1
NMEAMode=off
AutoMonitorSeconds=0

[Channel 1]
SensorName1=SV.Xchange
BoardSN1=004887
SensorSN1=200000
CalDate1=01/12/13
CalBy1=DO~
CalRange1=1375-1625 m/s
CalAccuracy1=+0.006 m/s avg
A= 0.000000E-01
B= 0.000000E-01
C= 4.812027E-07
D= 1.947835E-07
E=-1.838972E-05

F= 1.954828E-07
G= 0.000000E-01
H= 0.000000E-01>

NMEA-like output format

The OEM Xchange™ Primary Mount can be configured to produce an output similar to that regulated by the National Marine Electronics Association or NMEA as follows:

$AML,SVM,1487.94,SN,200000*3E

where $AML is always present, SVM identifies the next value as sound velocity in meters, and the sensor serial is also displayed. * identifies the end of the data, and the following two characters are the NMEA checksum in hexadecimal. It's calculated by XORing all the characters in the string except the $ and * characters.The following table lists all format codes.

Code	Description	Units
SVM	Sound Velocity	meters/second (m/s)
SVF	Sound Velocity	feet/second (ft/s)
CM	Conductivity	milliSiemens/centimeter (mS/cm)
CS	Conductivity	Siemens/meter (S/m)
CR	Conductivity Ratio	---
SN	Serial Number	---

To configure NMEA-like output the following commands are used with a terminal emulation program, such as Hyperterminal:

- SET NMEAON (turns on NMEA-like format)
- SET NMEAOFF (turns off NMEA-like format)

The AUTOMONITOR command is often used when NMEA-like output is enabled. It allows MONITOR mode to be automatically entered after a period of no activity on the user terminal. Time is 0 for no timeout (i.e. the command line waits forever for a command) to 255 seconds. To configure AUTOMONITOR the following commands are used:

- SET AUTOMONITOR 10 (MONITOR starts after 10 sec of inactivity)
- SET AUTOMONITOR 30 (MONITOR starts after 30 sec of inactivity)
- SET AUTOMONITOR 0 (MONITOR deactivated)

Example outputs:

>set nmeaon
NMEA-like output enabled
>monitor
$AML,SVM,1487.94,SN,200000*3E
$AML,SVM,1487.95,SN,200000*3F
$AML,SVM,1487.95,SN,200000*3F
$AML,SVM,1487.96,SN,200000*3C
> set nmeaoff
NMEA-like output disabled
>monitor
1487.94
1487.95

1487.94
1487.96
1487.94
>set automonitor 10
Automonitor set to10 sec

Customer Support

Troubleshooting

Instrument fails to communicate:

- Check the cables
  - Is the data power cable connected to the circuit board terminal block and computer?
  - Are there any cuts in the cable?

- If powering over a long cable, check the voltage drop over the cable. Measure the voltage at the circuit boards. The voltage must be above 8 volts.

- Are the communication settings in the program used on the computer correct?
  - Comm port selection
  - 8 bits
  - 1 stop bit
  - No parity
  - No hardware handshaking
  - Baud rate between 600 and 38,400 baud

- Are the communication settings in the instrument correct?
  - Was the instrument specifically set to one baud rate last time? If so, the user must use that baud rate to resume communications.
  - Was the instrument set to RX OFF last time? If so, a carriage return must be sent to the instrument immediately after power is applied to interrupt this mode.
  - Was the instrument set to monitor on power up mode? If so, a carriage return must be sent to the instrument immediately after power is applied to interrupt this mode

Instrument generates noisy data:

- Are the wires secure in the terminal block on the circuit boards?
- Is there noise on the power supply? Switching power supplies are common sources of noise.
- Nearby EMI sources such as electric motors can create noise. If possible move the instrument and its cables away from the noise source. Is the instrument securely fastened to prevent vibrations?
- Is the SV•Xchange™ sensor clean of dirt and bubbles?
- Is the Conductivity•Xchange™ sensor clean of dirt and bubbles?
- Is there something nearby affecting the water temperature?

AML Oceanographic Contact Info

Service:
To request an RMA or technical support

Email: service@AMLoceanographic.com
Phone: 1-250-656-0771
Fax: 1-250-655-3655

Sales:
For all general sales inquiries

Email: sales@AMLoceanographic.com
Phone: 1-250-656-0771
Fax: 1-250-655-3655

Website:
http://www.AMLoceanographic.com

My AML Oceanographic:

My AML Oceanographic is AML's on-line data centre. This secure area within our website is designed to offer one easy location for interested individuals and organizations - distributors, customers, prospects, and other members of our community - to manage their interactions with AML. The functionality within My AML Oceanographic is expected to evolve quickly. Upon launch, My AML Oceanographic will allow you to:

- View and manage your assets (instruments and sensors)
- Consult instrument diagnostic summaries
- View and download calibration and conformity certificates
- View and manage your technical support cases
- Consult and download sales estimates, sales orders, and invoice copies
- View account balances and generate account statements
- Assess inventory availability at AML

Appendices

Commands

When using SeaCast, the command set is not usually necessary. However, text commands are available. Below is a listing of commonly used commands. Note that some commands are only be available on instruments equipped with the appropriate with Xchange™ sensors.

Communications commands

Command	Description	Requires
SET FORCE 232	Sets com mode to RS-232. Power must be cycled for changes to take effect.	
SET FORCE 485	Sets com mode to RS-485. Power must be cycled for changes to take effect.	
SET FORCE AUTO	Sets for auto-detection of RS-232 or RS-485 comms. Note that if instrument is not connected to a com port on power up, it assumes RS-485 operation & will remain in that mode until powered down.	
DISPLAY FORCE	Displays current com mode (ie RS232, RS485, AUTO)	
DISPLAY DETECT	Displays the baud rate detection settings.	
SET DETECT ab	Sets the baud rate detection. 'a' sets the number of autobaud detection attempts before the instrument reverts to the default baud rate set by 'b'. Setting 'a'=0 forces the instrument to a fixed baud rate determined by 'b'. 'b'= 1 = 600 baud 4 = 4800 baud 7 = 38400 baud 2 = 1200 baud 5 = 9600 baud 8 = 57600 baud 3 = 2400 baud 6 = 19200 baud 9 = 115200 baud	

Sampling rate commands

Command	Description	Requires
DISPLAY SAMPLE RATE	Displays the time based sampling rate	
SET SAMPLE n t	Sets the desired sampling rate. 'n' is a number and t is the time units. Examples are: SET S C sets the sampling to continuous (25 Hz) SET S 5 /s 5 samples per sec SET S 1 s 1 sample per second SET S 2 /m 2 samples per minute SET S 5 m 1 sample every 5 minutes SET S 2 /h 2 samples per hour SET S 24 h 1 sample every 24 hours	
SET SV ZEROSUPPRESSION n [seconds | minutes]	Suppresses 0 m/s SV readings for n seconds or minutes up to a maximum of 900s or 15m. Instead, the last non-zero reading is displayed until n seconds or minutes have passed or the next non-zero SV reading resets the timer. Examples are as follows: SET SV ZEROSUPPRESSION 10 seconds Suppresses 0 m/s SV readings for up to 10 seconds or until next non-zero reading. SET SV ZEROSUPPRESSION 1 minute Suppresses 0 m/s SV readings for up to 1 minute or until next non-zero reading.	
DISPLAY SV ZEROSUPPRESSION	Displays the zero suppression setting. The zero suppression setting is also included in the output from a DISPLAY OPTIONS command.	

Output format commands

Command	Description	Requires
DISPLAY STARTUP	Displays the power up output settings	
SET CONDUCTIVITY UNITS x/y	Sets conductivity units for real output to x/y. Where x/y = mS/cm, S/cm, Cr (conductivity ratio)	
SET SV UNITS x/y	Changes the output units of the sensor. Where x/y = m/s, ft/s	
SET STARTUP PROMPT	Sets the instrument to wait for user commands on power up.	
SET STARTUP SCAN	Sets the instrument to output one scan on powerup nd then wait for a user command.	
SET STARTUP MONITOR	Sets the instrument to start monitoring data on power up	
SET STARTUP NOHEADER	Disables the instrument identification header output on powerup.	
SET STARTUP HEADER	Enables the instrument identification header output on powerup.	
SET NMEAON	Turns NMEA-like format on	
SET NMEAOFF	Turns NMEA-like format off	
SET AUTOMONITOR n	Automatically starts MONITOR after n seconds of command line inactivity (0≤n≤255). If n=0 AUTOMONITOR is disabled	
SET xxxxx FORMAT ab	Changes the numerical output format of the sensor. Where xxxxx=sensor type (SV, CONDUCTIVITY). a = number of digits ahead of the decimal place. b = number of digits after the decimal place	Any sensor

General commands

Command	Description	Requires
SCAN	Measure and output one scan of data	
MONITOR	Scan at the set sampling rate.	
VERSION	Displays the instrument identification header.	
DISPLAY OPTIONS	Displays the instrument status and user settings	
DETECT	Checks each slot in logger board to identify what is plugged in and displays sensor / board type & serial number or empty for each slot.	

Technical Specifications

Sensors

Primary Xchange™ Sensors					
Type	Range	Accuracy	Precision	Resolution	Response Time
Conductivity•Xchange™	0 to 70 mS/cm	±10 µS/cm	±3 µS/cm	1 µS/cm	25 ms at 1 m/s flow rate
Conductivity•Xchange™	0 to 2 mS/cm	±10 µS/cm	±0.6 µS/cm	0.1 µS/cm	25 ms at 1 m/s flow
SV•Xchange™	1375 to 1625 m/s	±0.025 m/s	±0.006 m/s	0.001 m/s	47 µs

Electrical

- Communications Board
  - RS-232 Comm board or
  - RS-485 Comm board
  - TTL Comm board
- Sensor Boards
  - Sound velocity or conductivity Xchange™ sensor board or

- Auto detect RS232 or RS485 (½ duplex ASCII) or TTL
- Autobaud to 38,400 (default)

Power

External Power Supply		
Comms Configuration	Type	Voltage range
RS-232 or RS-485	External	8 to 26 VDC
TTL	External	6 to 16 VDC

Current Consumption			
Type	Sensor	Standby	Sampling
Primary	Conductivity•Xchange™	95 mA	100 mA
Primary	SV•Xchange™	60 mA	65 mA

Pressure case

- Environmental Limits
    - Storage, -20°C to 60°C
    - Usage, -20°C to 45°C

Sampling capabilities

- Frequency
    - Time: selectable sample rates from 25 per second to 1 per hour
- Configurations
    - Single scan or continuous output
    - on command or autonomous on power up

Included items

- OEM Xchange™ Primary Mount One sensor blanking plug
- CD with manuals and documentation

Software

- SeaCast

Ordering Codes

Instruments

PDC-OEX-SV-232	OEM Xchange™ SV Mount and Electronics for RS-232 Communications
PDC-OEX-SV-485	OEM Xchange™ SV Mount and Electronics for RS-485 Communications
PDC-OEX-SV-TTL	OEM Xchange™ SV Mount and Electronics, Direct TTL Communications

Sensors

XCH-SV-STD	SV • Xchange™ (1375-1625m/s) Range *Replaces XCH-0002*
XCH-RA002	C • Xchange™ Right Angle, Ultra Freshwater (0-2mS/cm) Range
XCH-CND-RA070	C • Xchange™ Right Angle, Oceanographic (0-70mS/cm) Range
XCH-CND-RA090-HA	C • Xchange™ Right Angle, Oceanographic (0-90mS/cm) Range
XCH-CND-ST002	C • Xchange™ Straight, Ultra Freshwater (0-2mS/cm) Range
XCH-CND-ST070	C • Xchange™ Straight, Oceanographic (0-70mS/cm) Range

Warranty

AML warrants the instrument for a period of two years from the date of delivery. AML will repair or replace, at its option and at no charge, components which prove to be defective. The warranty applies only to the original purchaser of the instruments. The warranty does not apply if the instrument has been damaged, by accident or misuse, and is void if repairs or modifications are made by other than authorized personnel.

This warranty is the only warranty given by AML. No warranties implied by law, including but not limited to the implied warranties of merchantability and fitness for a particular purpose shall apply. In no event will AML be liable for any direct, indirect, consequential or incidental damages resulting from any defects or failure of performance of any instrument supplied by AML.

OEM Xchange™ Overview Drawings

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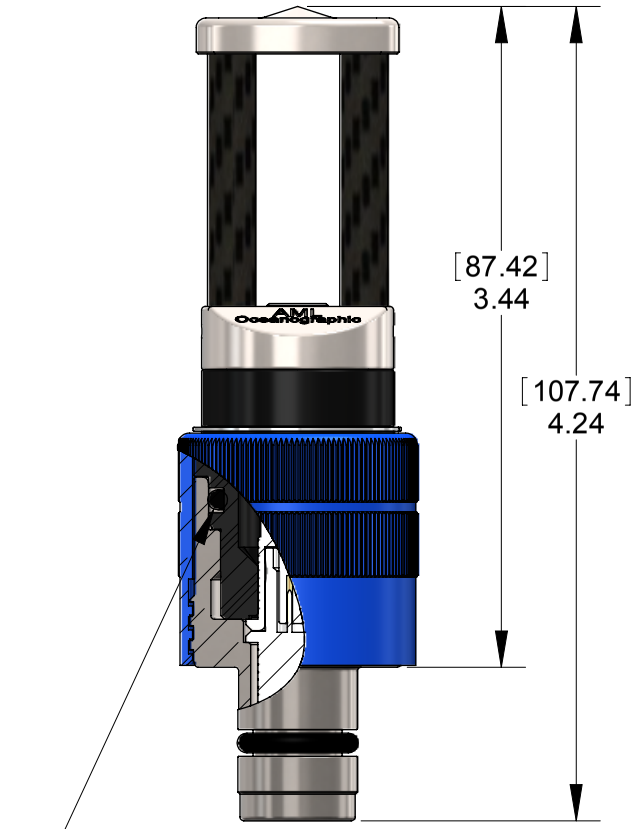
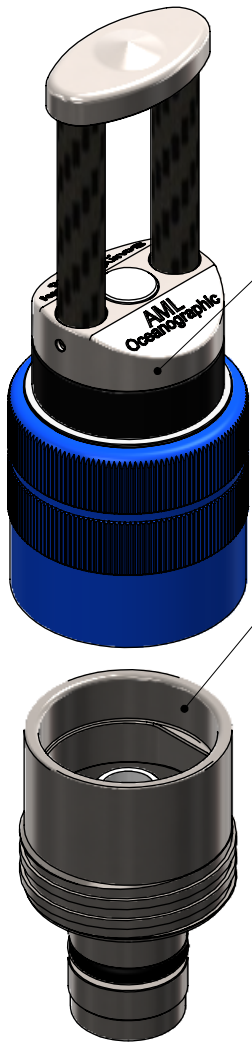
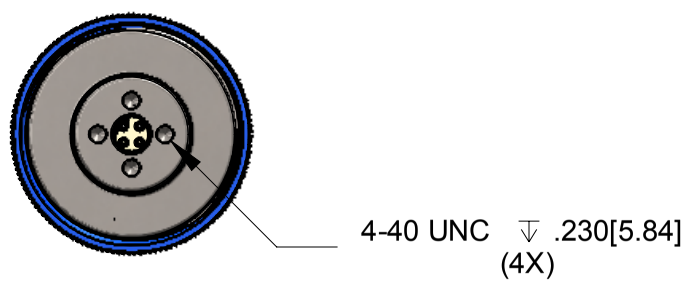
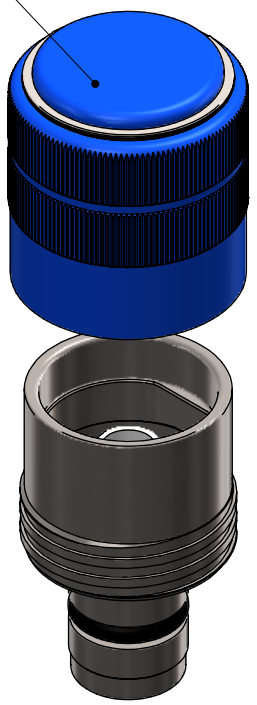


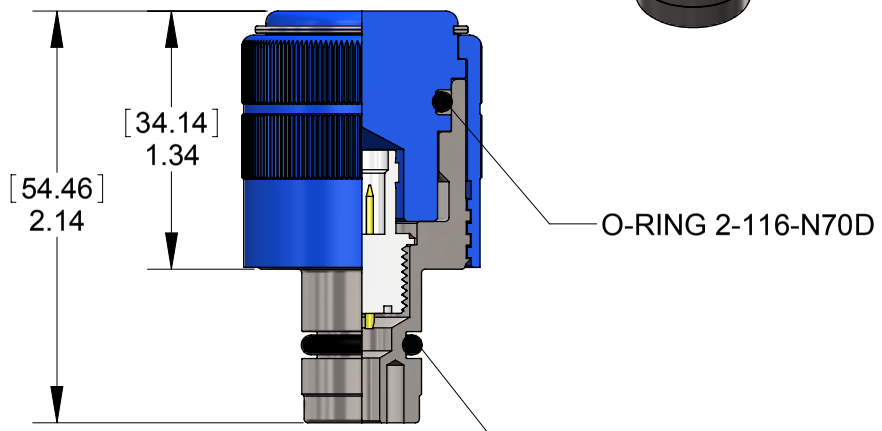




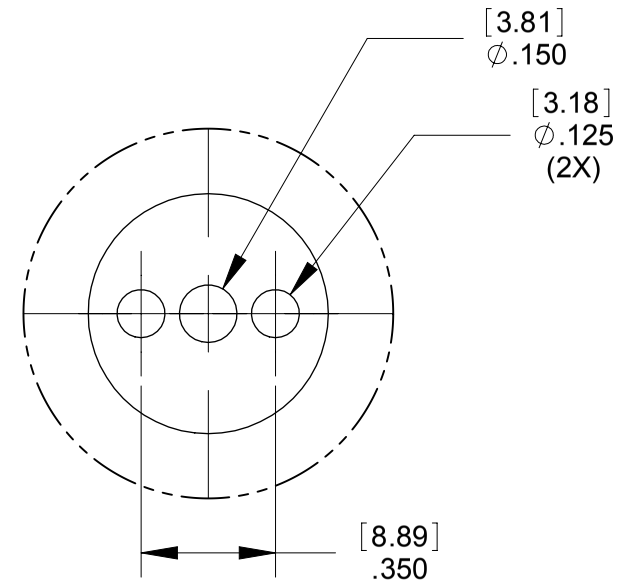
SENSOR ASSEMBLY

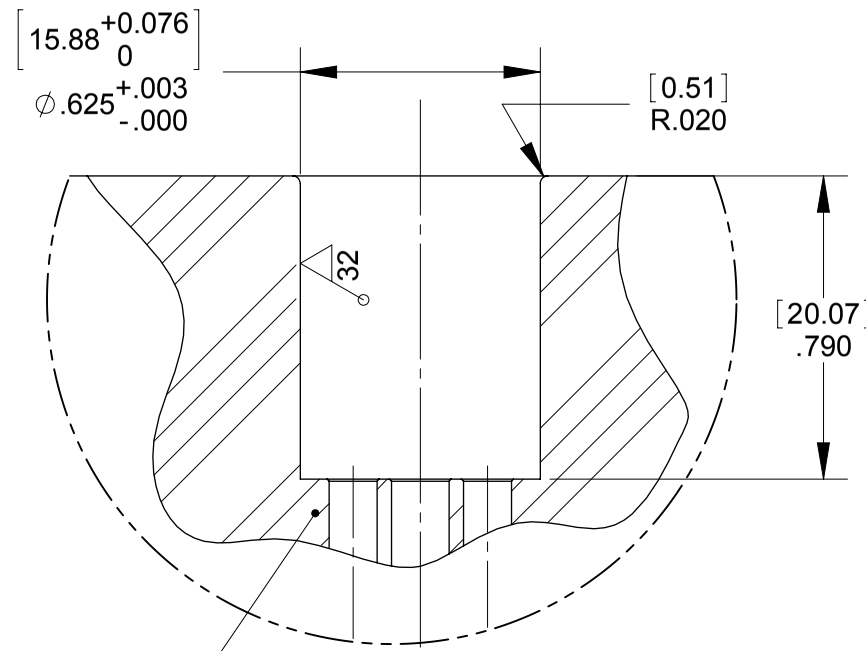
BLANKING PLUG ASSEMBLY
AML Part No: SUB-G0548
WEIGHT: 22 GRAMS





BLANKING PLUG ASSEMBLY





MOUNTING REQUIREMENTS

REV	DESCRIPTION	BY	DATE

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DIMENSIONS AND TOLERANCES:

UNITS:	INCHES [MM]
ANGLES:	± 1˚
FRACTIONS:	± 1/32
HOLE SIZES:	± 0.005(0.13)
0.00:	± 0.015(0.38)
0.000:	± 0.005(0.13)

UNLESS OTHERWISE SPECIFIED:

ORIGINAL SCALE:1:1

HOLE DEPTHS GIVEN FOR FULL DIAMETER.

SURFACE FINISH: 63

TITLE:

SV Xchange OEM Specification

DRAWN	DATE	DRAWING NO.:	REV	AML NO.
I.L.	MAR 02/10	SNS-GQ-03203		UNSPECIFIED
REVISION	*DATE*	*MATERIAL:*		
		N/A		
	SIZE B	*SLD FILE NO.:* SNS-GQ-03203		*SHEET NO.* Sheet1 of 3

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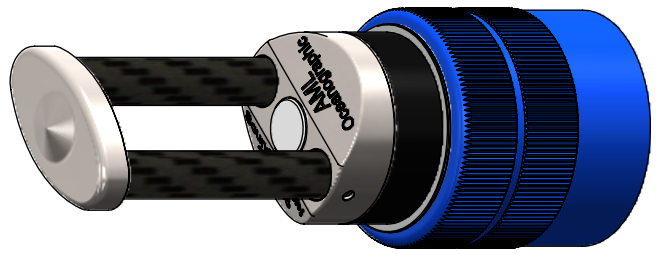
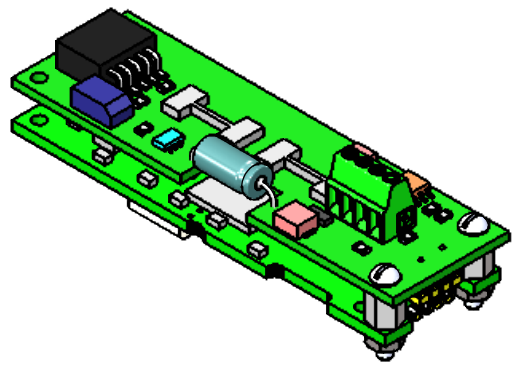
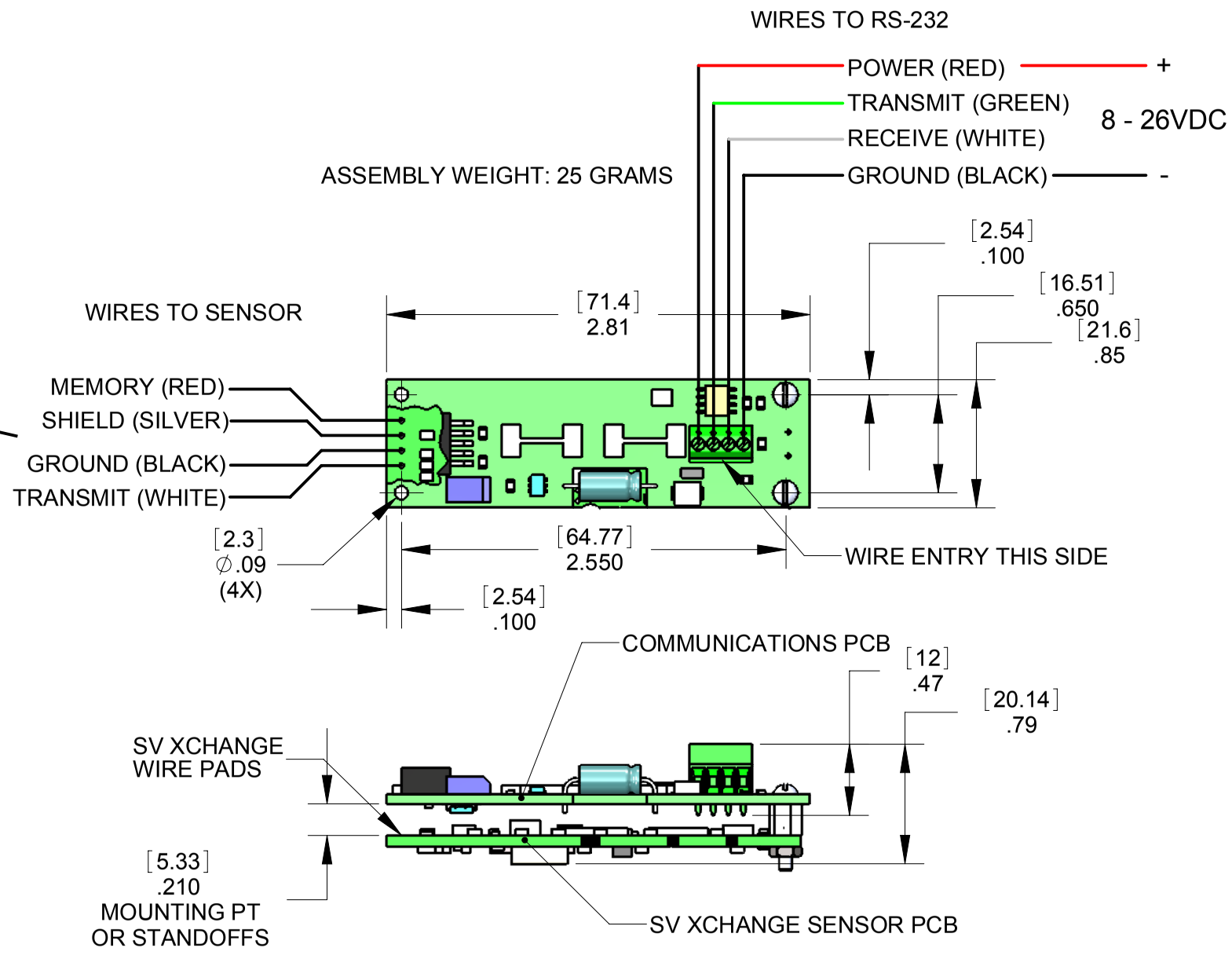
SV XCHANGE ELECTRONICS OVERVIEW
RS-232







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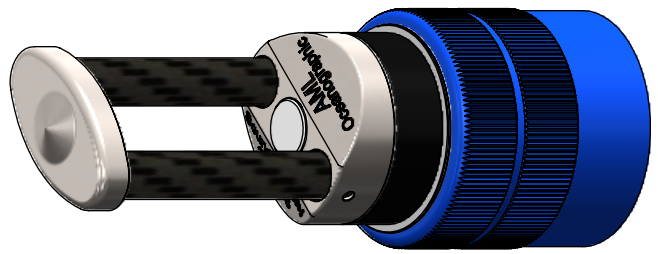

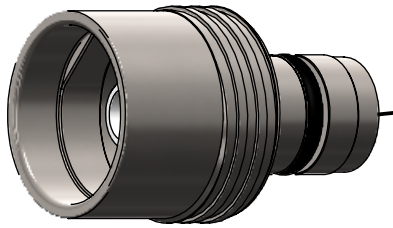

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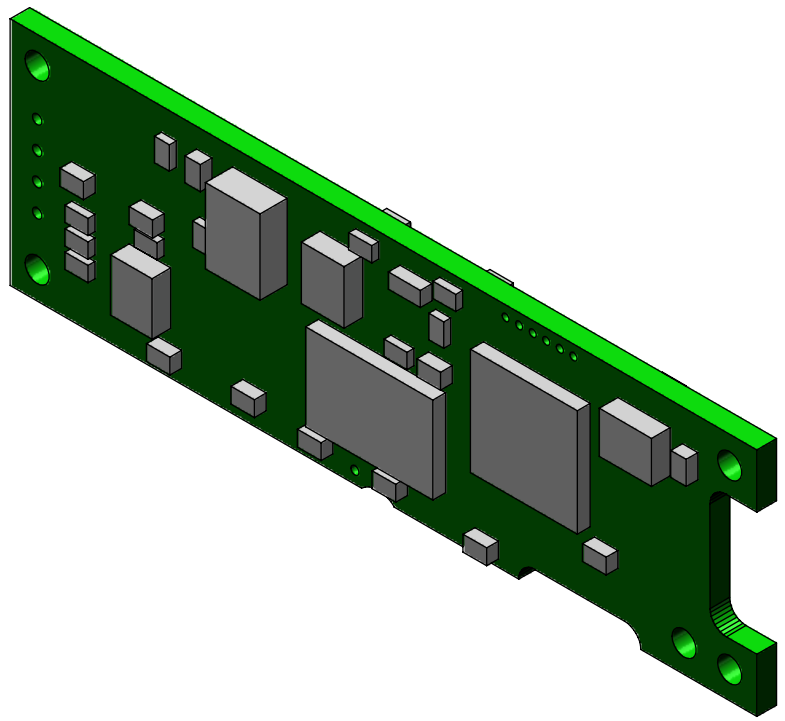
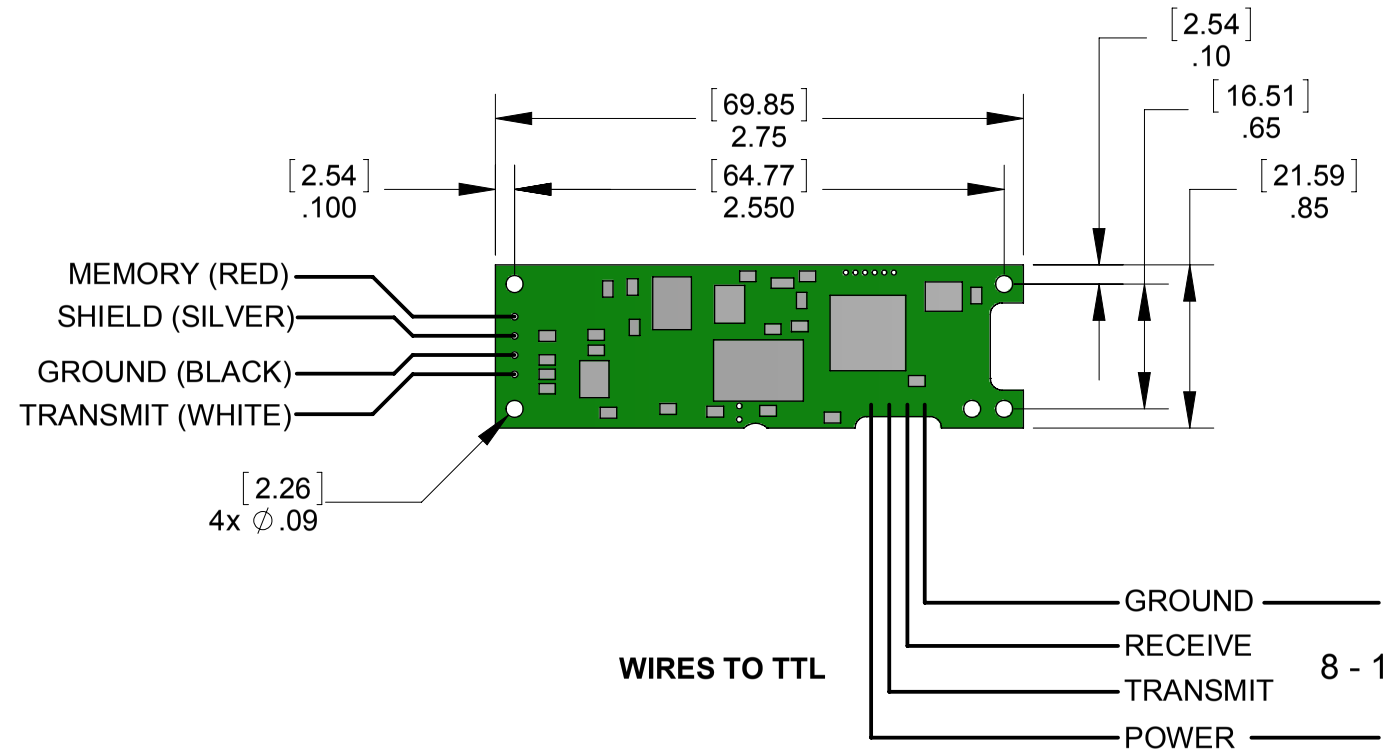
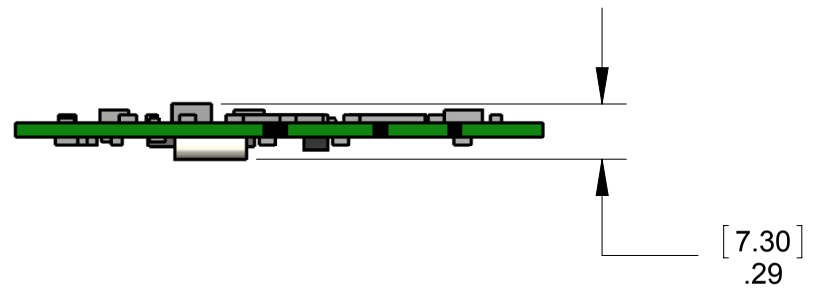


SV XCHANGE ELECTRONICS OVERVIEW
TTL INTERFACE

ASSEMBLY WEIGHT: 13 GRAMS



WIRES TO TTL



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SV Xchange OEM Specification

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		N/A		
	SIZE B	*SLD FILE NO.:* SNS-GQ-03203		*SHEET NO.* Sheet3 of 3

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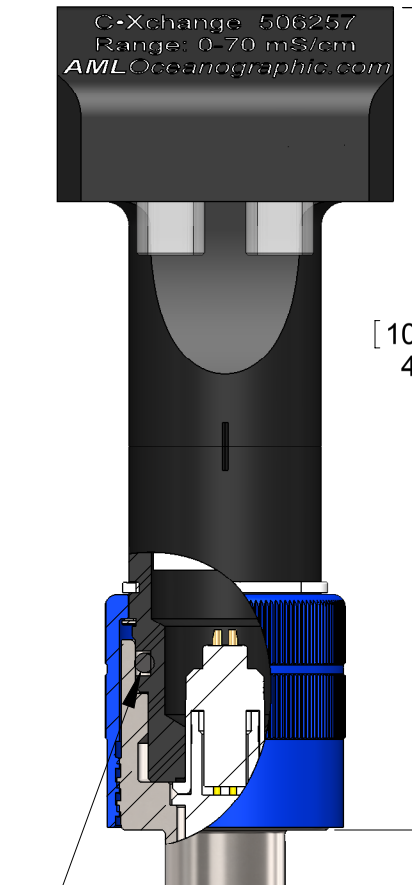

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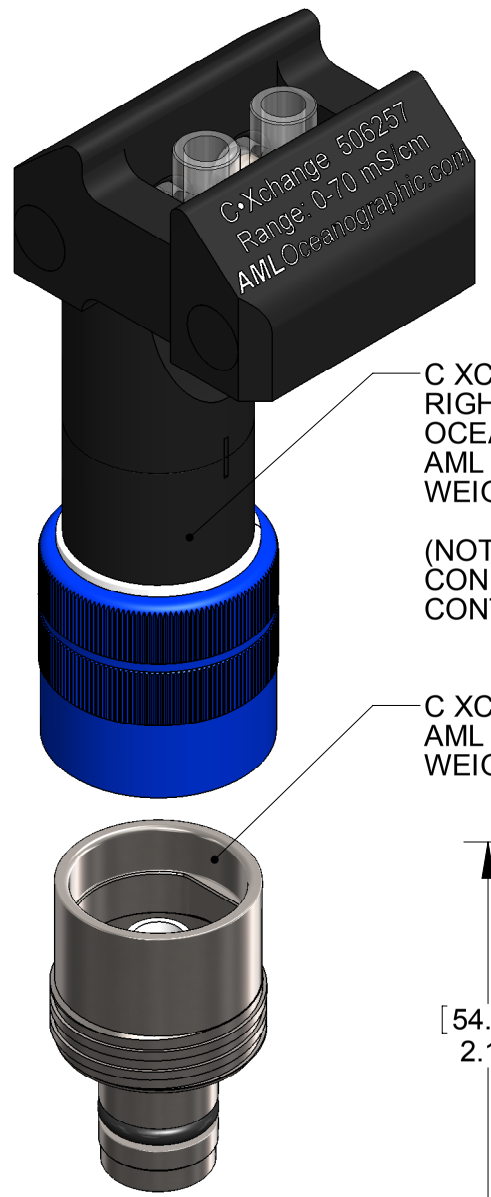
O-RING 2-116-N70D

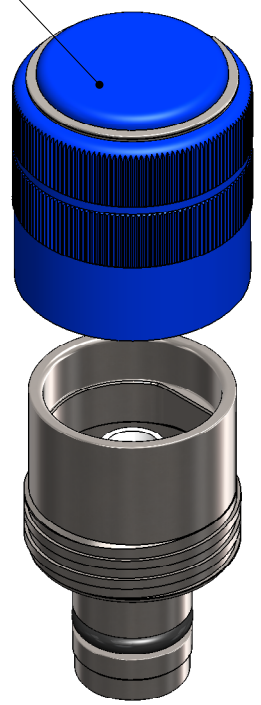


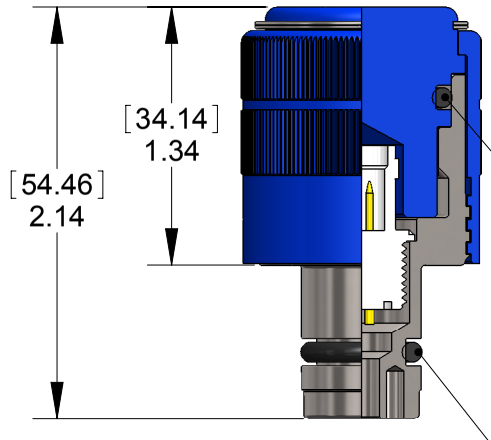
C XCHANGE SENSOR
RIGHT ANGLE
OCEANOGRAPHIC RANGE
AML Part No: XCH-0046
WEIGHT: 121 GRAMS

(NOTE: OTHER RANGES AND CONFIGURATIONS AVAILABLE. CONTACT AML OCEANOGRAPHIC.)

C XCHANGE TITANIUM BULKHEAD
AML Part No: SUB-G0532
WEIGHT: 48 GRAMS

BLANKING PLUG ASSEMBLY
AML Part No: SUB-G0548
WEIGHT: 22 GRAMS





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1.34

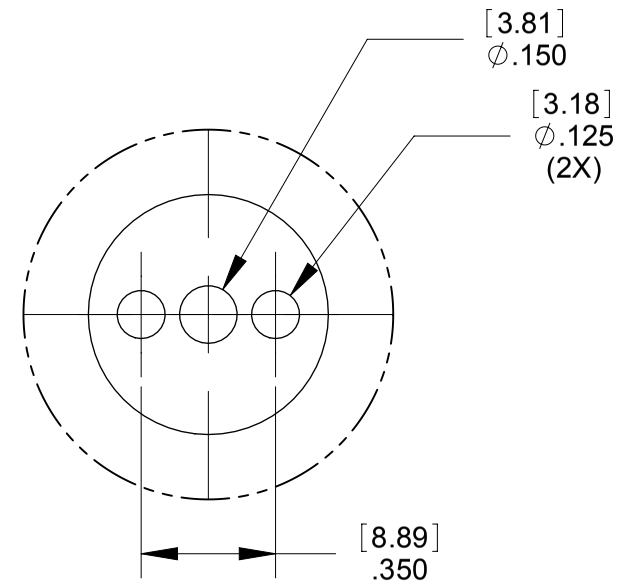
O-RING 2-116-N70D

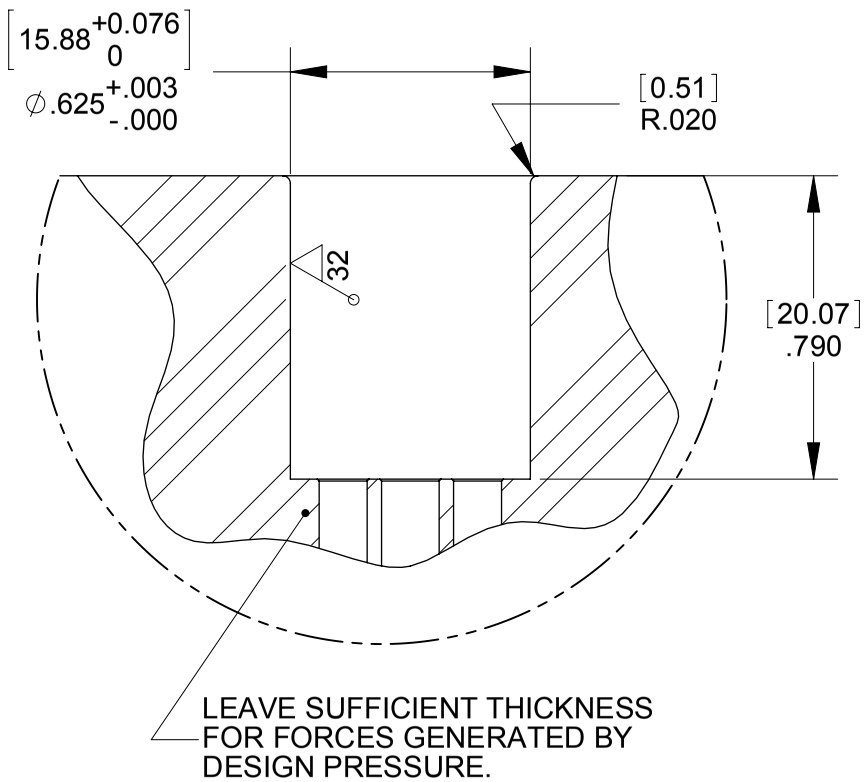
O-RING 2-111-N70D

4-40 UNC ↧ .200[5.08]
(4X)

SENSOR ASSEMBLY

BLANKING PLUG ASSEMBLY





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SURFACE FINISH: 63

TITLE:
C Xchange OEM Specification

DRAWN	DATE	DRAWING NO.:	REV	AML NO.
I.L.	MAR 02/10	SNC-GA-03354		UNSPECIFIED
REVISION	*DATE*	*MATERIAL:*		
		N/A		
	SIZE B	*SLD FILE NO.:* SNC-GA-03354		*SHEET NO.* Sheet1 of 2

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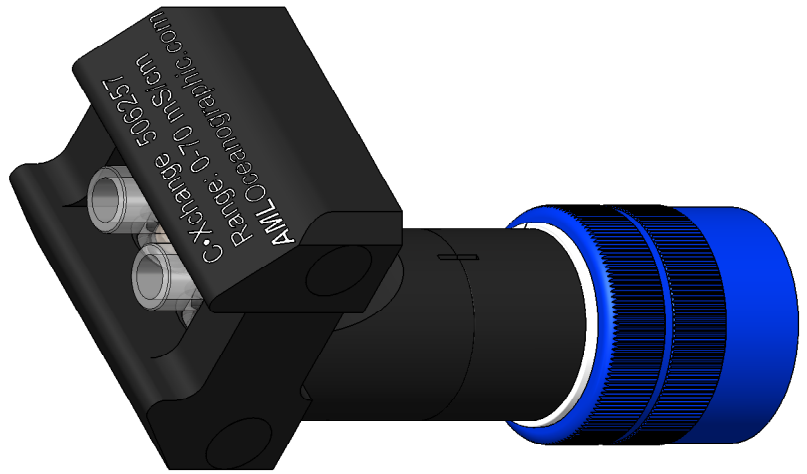

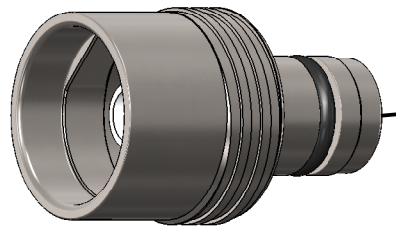

WIRE LENGTH
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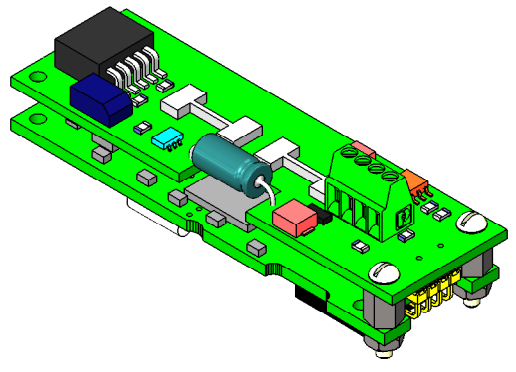
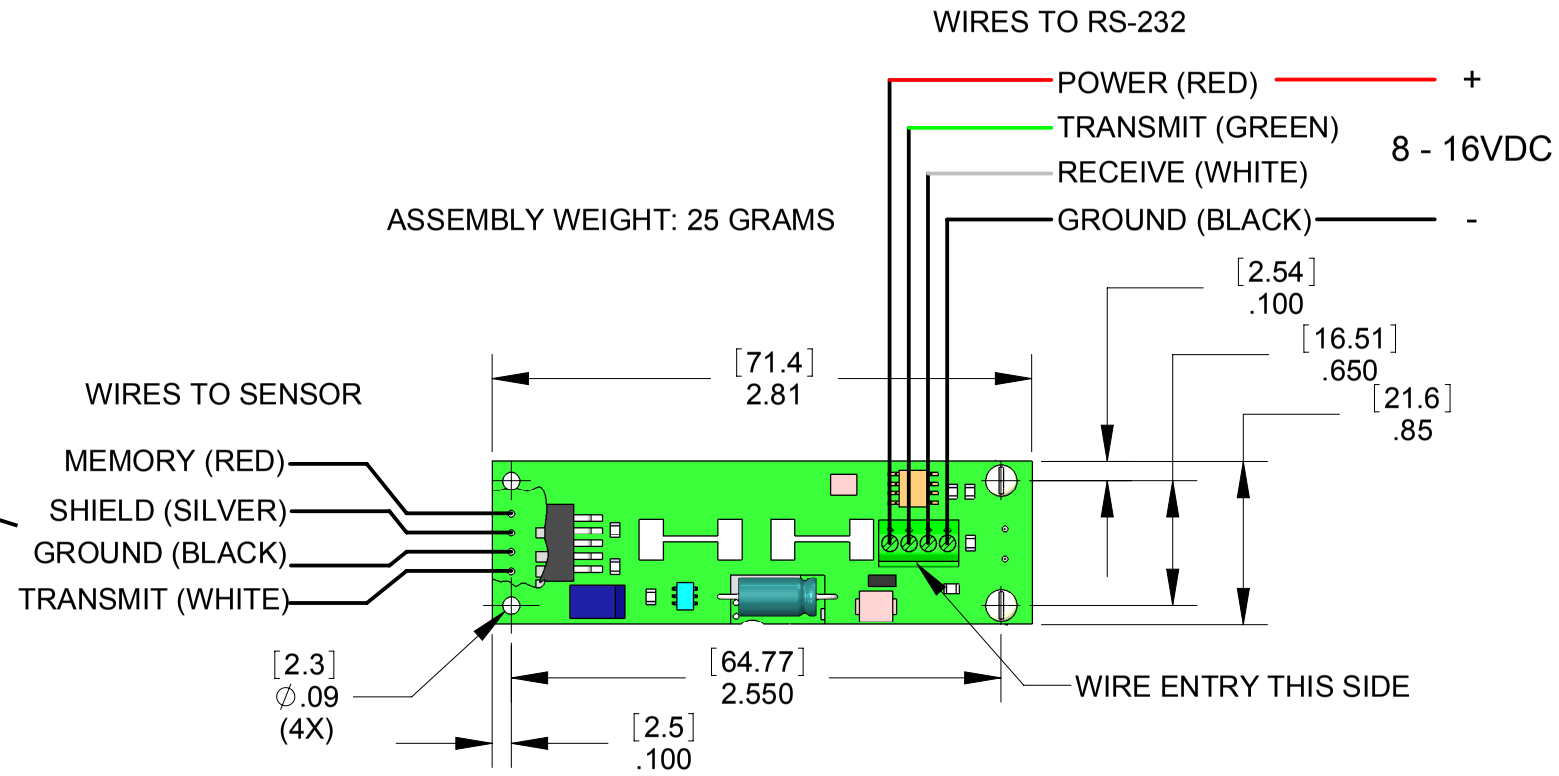
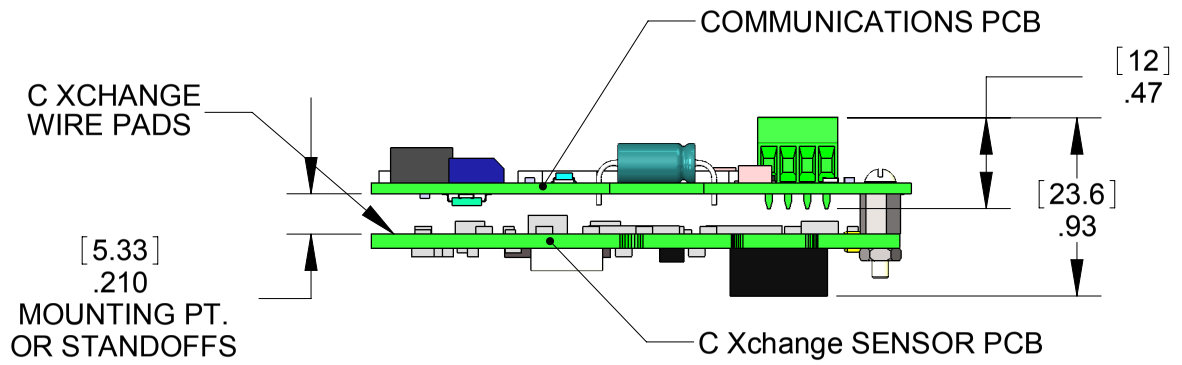
8.0



C XCHANGE ELECTRONICS





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REVISION	*DATE*	*MATERIAL:*	
		N/A	
	SIZE B	*SLD FILE NO.:* SNC-GA-03354	*SHEET NO.* Sheet2 of 2